



Operating Instructions

Position Switch

> 8070/1



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2 General Information

2.1 Manufacturer

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Internet: www.stahl.de

2.2 Information regarding the Operating Instructions

ID NO.: 131955 / 8070603300
Publication Code: S-BA-8070/1-02-en-29/10/2008
We reserve the right to make technical changes without notice.

3 Safety Instructions

Use the position switch only for its intended purpose.

Incorrect or impermissible use or non-compliance with these instructions invalidates our warranty provision.

No changes to the device impairing its explosion protection are permitted. Mount the device only if it is clean and undamaged.

Observe the following when using the station:

- ▶ National safety regulations
- ▶ National accident prevention regulations
- ▶ National assembly and installation regulations
- ▶ Generally recognised technical regulations
- ▶ Safety instructions in these operating instructions
- ▶ Characteristic values and rated operating conditions on the rating and data plates
- ▶ Additional instruction plates on the device
- ▶ According to IEC/EN 61241-0, a device must not be operated with a dust layer exceeding 50 mm.

Replace the switch after each short circuit in the main circuit (the element is hermetically sealed and the state of the switching contacts cannot be checked).

Any damage can invalidate the Ex-protection!

	On request, we will send you a copy of the EC type examination certificate with the relevant annex.
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4 Conformity to Standards

The devices comply with the following standards and directives:

- ▶ Directive 94/9/EC
- ▶ IEC/EN 60079-0, IEC/EN 60079-1, IEC/EN 60079-7
- ▶ IEC/EN 61241-0, IEC/EN 61241-1
- ▶ EN 50047
- ▶ EN 60947

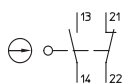
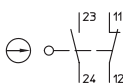
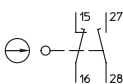
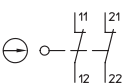
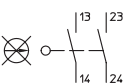
The devices are approved for use in hazardous areas zones 1, 2, 21 and 22.

5 Function

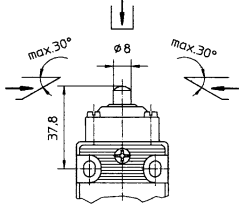
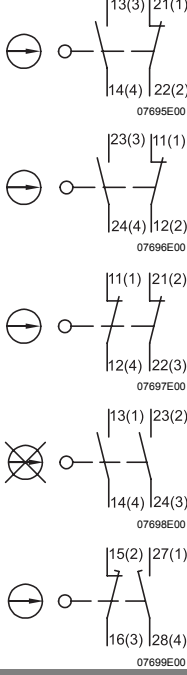
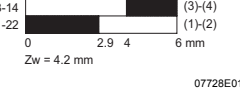
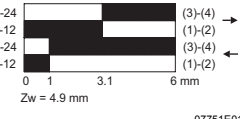
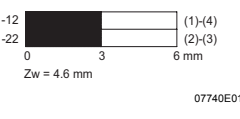
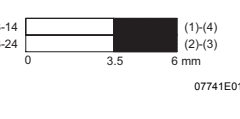
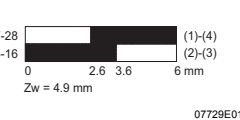
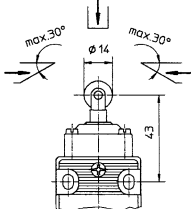
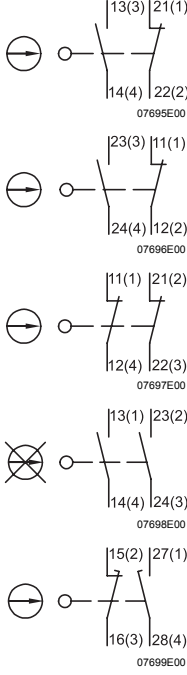
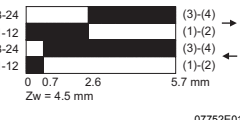
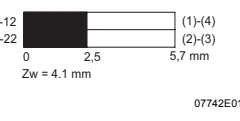
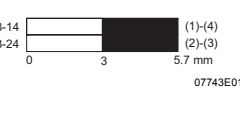
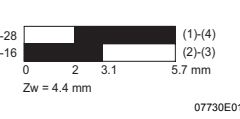
The type 8070/1 position switch comprises a flameproof switching element fitted into an increased safety enclosure. A choice of actuators is available. It is used to switch auxiliary, control and signal circuits in hazardous areas.

6 Technical Data

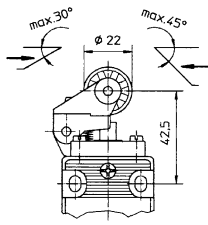
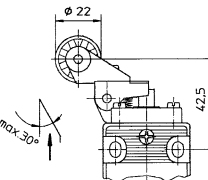
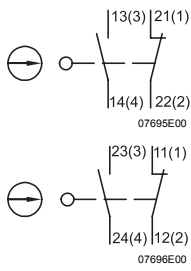
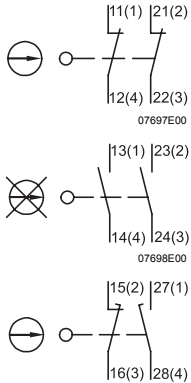
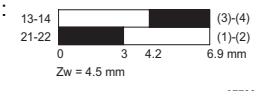
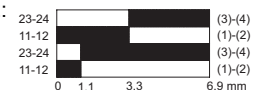
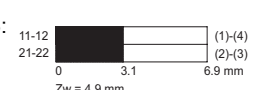
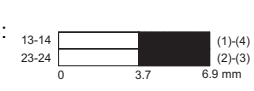
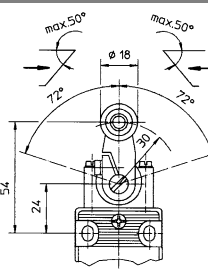
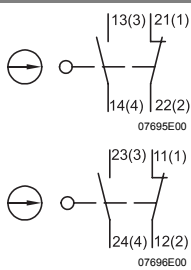
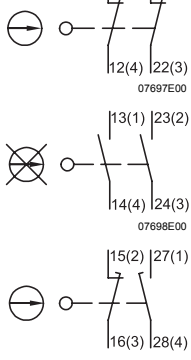
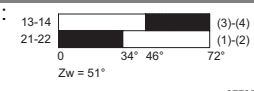
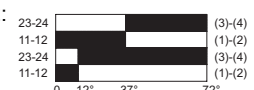
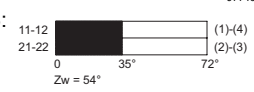
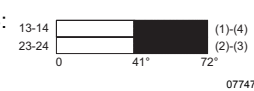
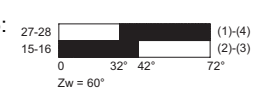
Explosion protection					
Gas explosion protection					
ATEX	II 2 G Ex de IIC T6				
IECEX	Ex de IIC T6				
Dust explosion protection					
ATEX	II 2 D Ex tD A21 IP65 T80 °C				
IECEX	Ex tD A21 IP65 T80 °C				
Certificates					
Gas explosion protection					
ATEX	PTB 01 ATEX 1053				
IECEX	IECEX PTB 06.0092				
Dust explosion protection					
ATEX	PTB 01 ATEX 1053				
IECEX	IECEX PTB 06.0092				
Rated operational voltage U _e			8070/1-1 8070/1-2 8070/1-5	8070/1-3 8070/1-4	
	Alternating current for equal potential:		max. 500 V	max. 400 V	
	Alternating current for unequal potential:		max. 250 V	max. 250 V	
	Direct current:		250 V	250 V	
Rated operational current I _e	max. 10 A: - 20 °C ≤ Ta ≤ + 50 °C max. 6 A: - 20 °C ≤ Ta ≤ + 70 °C				
Switching capacity	AC 12		AC 15		DC 12
	8070/1-1 8070/1-2 8070/1-5	8070/1-3 8070/1-4	8070/1-1 8070/1-2 8070/1-5	8070/1-3 8070/1-4	8070/1-.
	max. 250 V max. 500 V **) max. 10 A max. 5000 VA	max. 250 V max. 400 V **) max. 10 A max. 4000 VA	max. 250 V max. 500 V **) max. 10 A max. 1000 VA	max. 250 V max. 400 V **) max. 10 A max. 1000 VA	max. 125 V max. 10 A max. 400 W
	**) Only for equal potential				
Rated insulation voltage	550 V				
Rated impulse withstand voltage	6 kV				
Short circuit protection	10 A gL / gG				

Contact block			
Version	Slow-action contact  8070/1-1 08667E00 Snap-action contact  8070/1-2 08668E00 Slow-action contact, make before break  8070/1-5 08675E00		
	 8070/1-3 08669E00  8070/1-4 08670E00 Attention: The positive opening function $\ominus$ depends on the actuator used		
Contact arrangement	2-pole, galvanically isolated, with double break action		
Contact opening	≥ 1.5 mm (isolating distance ≥ 3 mm)		
Contacts	Silver-nickel		
Service Life			
mechanical	max. 10^6 operations		
electrical	max. 10^6 operations		
Enclosure contact	Polyamide, glass fibre reinforced		
Operating temperature range	- 20 °C ... + 50 °C (10 A) - 20 °C ... + 70 °C (6 A)		
Maximum switching frequency	max. 6000 operations/h		
Ingress protection	IP65		
Enclosure material	Polyamide, glass fibre reinforced, black		
Cable glands	8161/5-M 20-13 8161/5-M 25-17 On the enclosure bottom: 1 x M 20 x 1.5 resp. 1 x M 25 x 1.5 On the enclosure side: 1 x M 20 x 1.5		
Connection	With cable glands 8161: For plastic sheathed cable 4 x 2.5 mm ² (diameter 6 ... 13 mm); recommended 4 x 1.5 mm ² With mounted connecting cable: Plastic sheathed cable HK-SO-X05VV-F-OZ 4 x 1.5 mm, cable length 6 m		
Terminals	1 x 2.5 mm ² or 2 x 1 mm ² , single-wire / finely-stranded		
Mechanical shock resistance	Snap-action contact: 2 g Slow-action contact: 20 g		
Tightening torque	Screw terminals: max. 0.4 Nm Cover screws: max. 0.7 Nm Connection thread: 2.3 Nm (M 20 x 1.5) 3.0 Nm (M 25 x 1.5) Pressure screw: 1.5 Nm (M 20 x 1.5) 2.0 Nm (M 25 x 1.5)		
	If terminal sleeves are used, they must be gas-tight and applied with a suitable tool.		

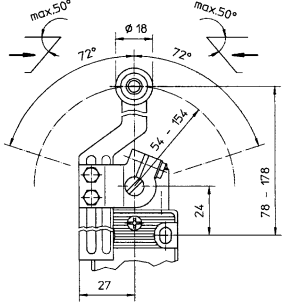
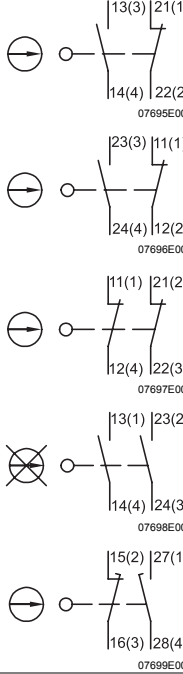
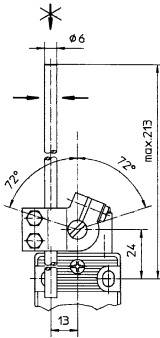
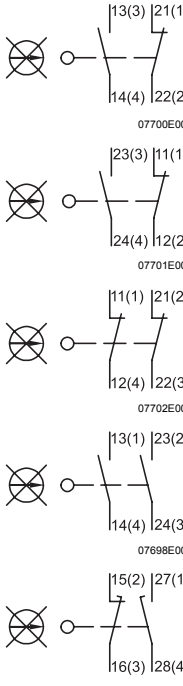
Operation, operating speed, contact travel or angle

Actuator	Operation	Diagram	Nominal contact travels or angles	Minimum force/torque
Type 8070/1	V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end	⊕ = Positive opening	■ = Contact closed □ = Contact open Zw = Travel for positive opening	
Extended plunger 8070/1- . -S	 Lateral operation: V = 0.5 m/s Operation in stroke direction: V = 0.5 m/s		In stroke direction 8070/1-1:  07728E01 8070/1-2:  07751E01 8070/1-3:  07740E01 8070/1-4:  07741E01 8070/1-5:  07729E01	15 N
Roller plunger 8070/1- . -RS	 Lateral operation: V = 0.5 m/s Operation in stroke direction: V = 0.5 m/s		In stroke direction 8070/1-1:  07731E01 8070/1-2:  07752E01 8070/1-3:  07742E01 8070/1-4:  07743E01 8070/1-5:  07730E01	15 N

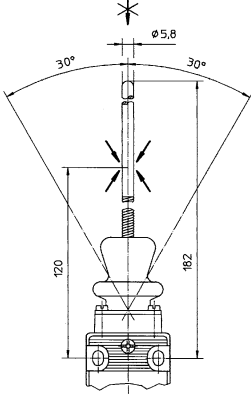
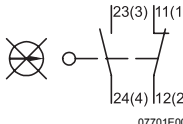
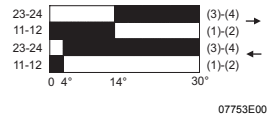
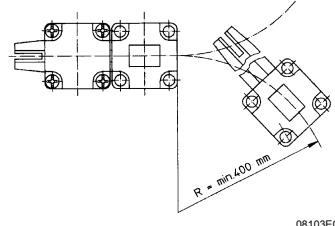
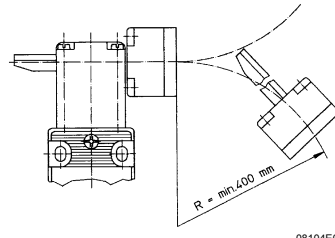
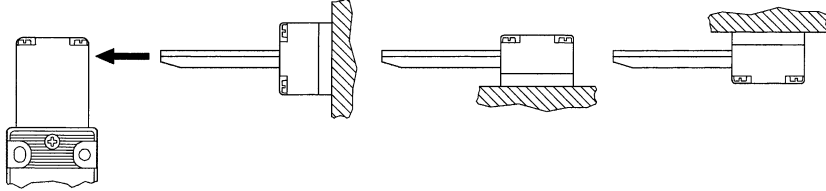
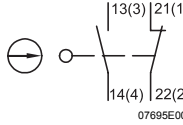
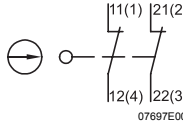
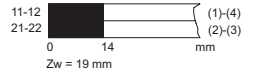
Operation, operating speed, contact travel or angle

Actuator	Operation	Diagram	Nominal contact travels or angles	Minimum force/torque
Type 8070/1	V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end	⊖ = Positive opening	■ = Contact closed □ = Contact open Zw = Travel for positive opening	
Roller lever plunger, form E 8070/1- . -AR	 V = 1,5 m/s  Angled roller lever made by rotating the roller lever plunger by 180°	 	8070/1-1:  8070/1-2:  8070/1-3:  8070/1-4:  8070/1-5: 	13 N
Swivelling roller lever form A 8070/1- . - HR311..	 V = 1.8 m/s	 	8070/1-1:  8070/1-2:  8070/1-3:  8070/1-4:  8070/1-5: 	HR311: 0.3 Nm HR311NR: 0.1 Nm

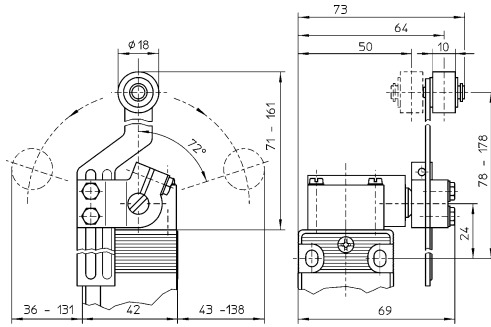
Operation, operating speed, contact travel or angle

Actuator	Operation	Diagram	Nominal contact travels or angles	Minimum force/torque
Type 8070/1	V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end	⊖ = Positive opening	■ = Contact closed □ = Contact open Zw = Travel for positive opening	
Adjustable roller lever 8070/1- . -HV	 08100E00 V = 1.4 m/s Should the adjustable roller lever swing back from an angle exceeding 40°, the lever could cause a false signal.	 07695E00 07696E00 07697E00 07698E00 07699E00	8070/1-1: 13-14 21-22 0 34° 46° 72° (3)-(4) (1)-(2) Zw = 51° 07735E00 8070/1-2: 23-24 11-12 23-24 11-12 0 12° 37° 72° (3)-(4) (1)-(2) (3)-(4) (1)-(2) Zw = 61° 07749E00 8070/1-3: 11-12 21-22 0 35° 72° (1)-(4) (2)-(3) Zw = 54° 07746E00 8070/1-4: 13-14 23-24 0 41° 72° (1)-(4) (2)-(3) 07747E00 8070/1-5: 27-28 15-16 0 32° 42° 72° (1)-(4) (2)-(3) Zw = 60° 07734E00	0.3 Nm
Actuating rod 8070/1- . -HH-K	 08101E00 V = 1.4 m/s No positive opening, not suitable for safety circuits	 07700E00 07701E00 07702E00 07698E00 07703E00	8070/1-1: 13-14 21-22 0 34° 46° 72° (3)-(4) (1)-(2) 07736E00 8070/1-2: 23-24 11-12 23-24 11-12 0 12° 37° 72° (3)-(4) (1)-(2) (3)-(4) (1)-(2) Zw = 61° 07749E00 8070/1-3: 11-12 21-22 0 35° 72° (1)-(4) (2)-(3) 07748E00 8070/1-4: 13-14 23-24 0 41° 72° (1)-(4) (2)-(3) 07747E00 8070/1-5: 27-28 15-16 0 32° 42° 72° (1)-(4) (2)-(3) 07737E00	0.3 Nm

Operation, operating speed, contact travel or angle

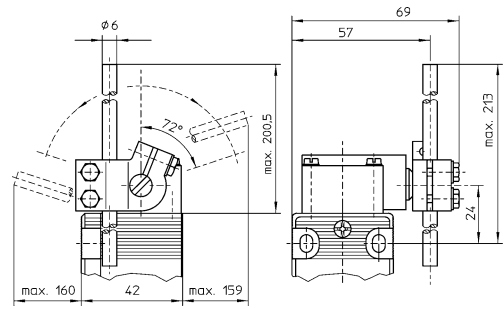
Actuator	Operation	Diagram	Nominal contact travels or angles	Minimum force/torque
Type 8070/1	V = Max. operating speed → = Direction of operation () = Connection for device with unconnected cable end	⊖ = Positive opening	■ = Contact closed □ = Contact open Zw = Travel for positive opening	
Spring-rod actuator 8070/1-2-F2	 No positive opening, not suitable for safety circuits		Only for use with snap-action contact! 8070/1-2: 	--
Safety switch with separate actuator 8070/1- . -ZB	  Do not use the switch as a mechanical stop.  The actuators can be mounted in several ways, this substantially increases the range of application of the switches.	 	8070/1-1:  8070/1-3: 	--

Dimensional Drawings (All Dimensions in mm) - Subject to Alterations



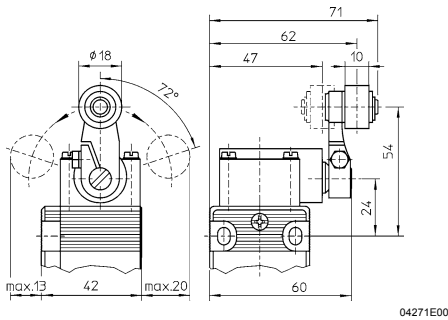
8070/1-.-HV
Adjustable roller lever

04274E00



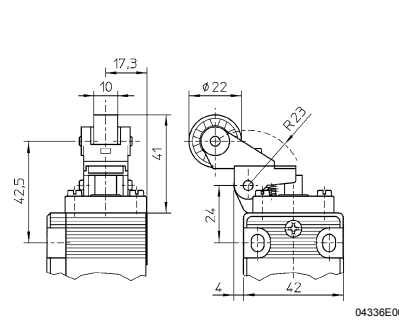
8070/1-.-HH-K
Actuating rod

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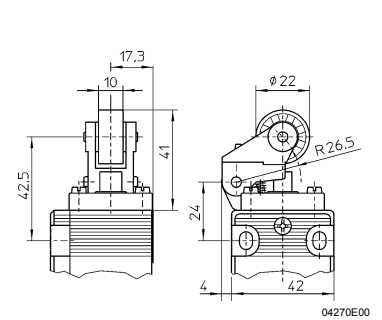
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8070/1-.-HR311..
Swivelling roller lever, form A



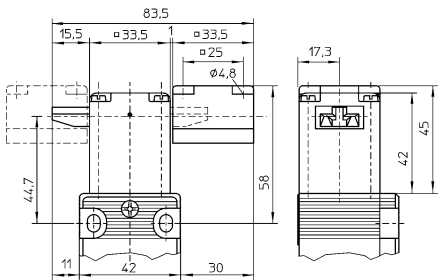
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8070/1-.-AR
Angled roller lever,
form E



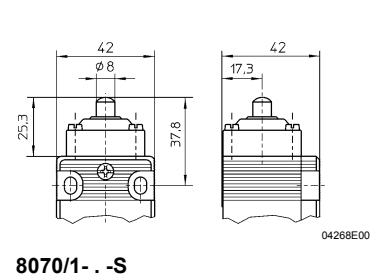
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8070/1-.-AR
Roller lever, form E



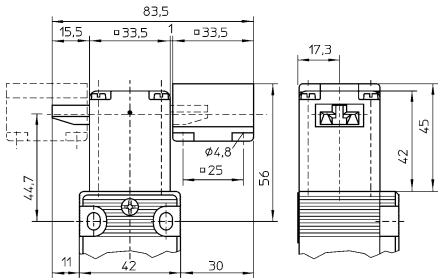
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8070/1-.-RS
Roller plunger



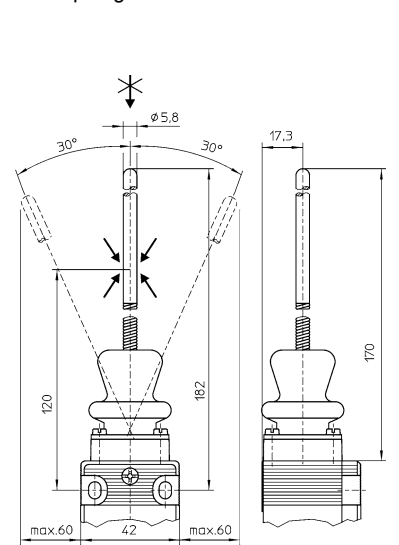
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8070/1-.-S
Extended plunger



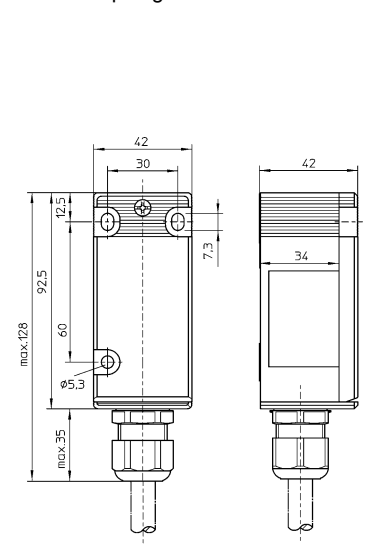
04278E00

8070/1-.-ZB
Safety switch with separate actuator



04351E00

8070/1-2-F2
Spring rod actuator



09385E00

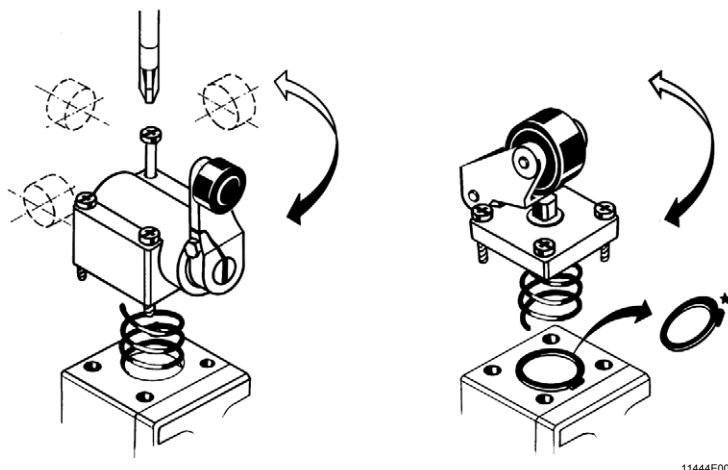
8070/1-.-OV
Position switch without insert

7 Assembly

WARNING

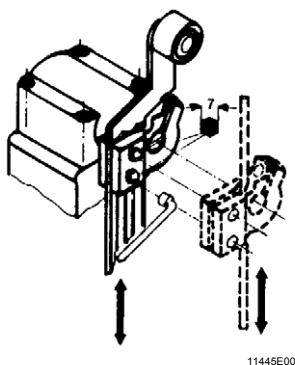
Do not use position switch as a mechanical stop.
Secure the limit switch against position change by means of a locking device.

Changing the actuator

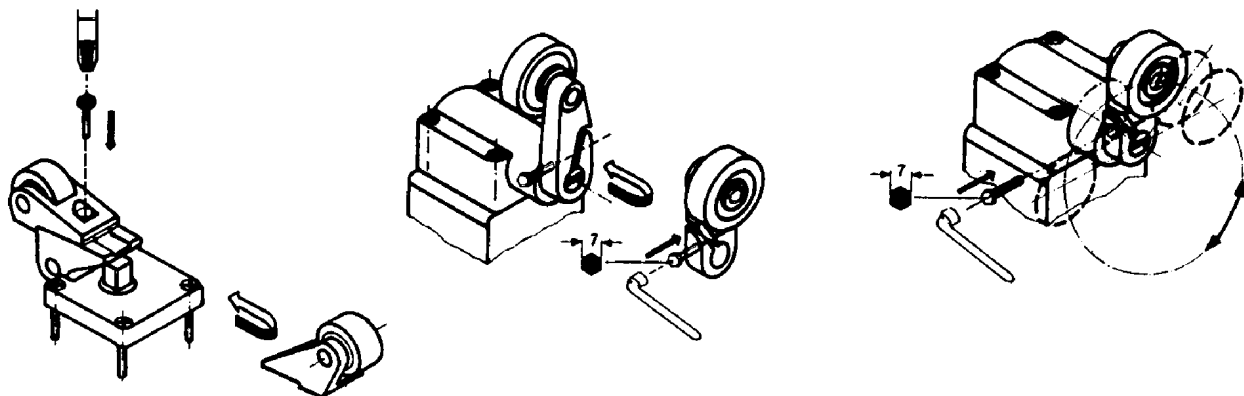


*) Remove the flat seal from the AR actuator.

Adjusting the lever position

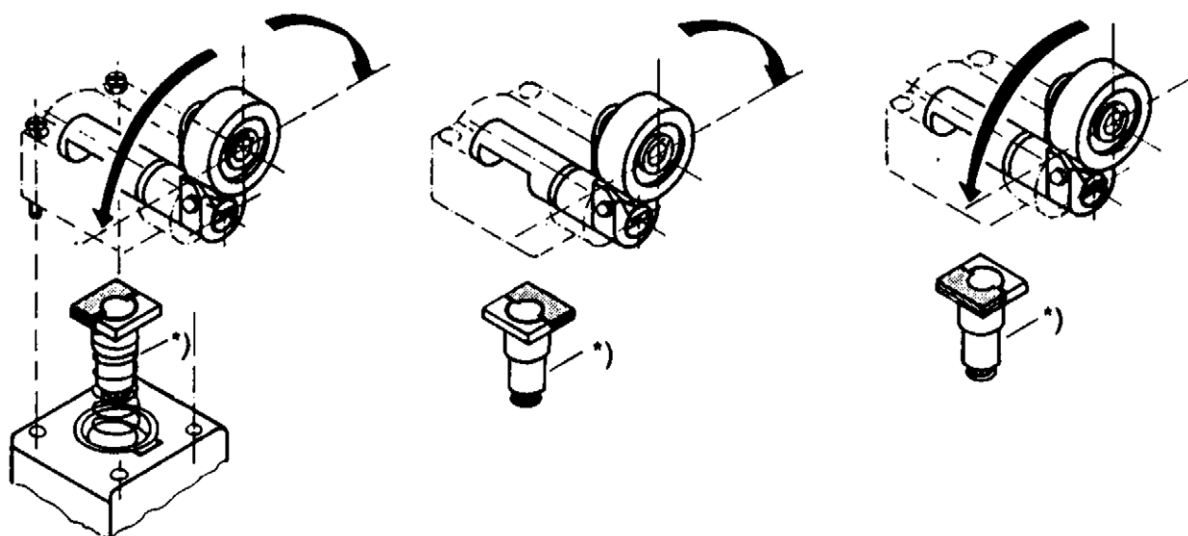


Changing the roller lever or swivelling roller lever position



11446E00

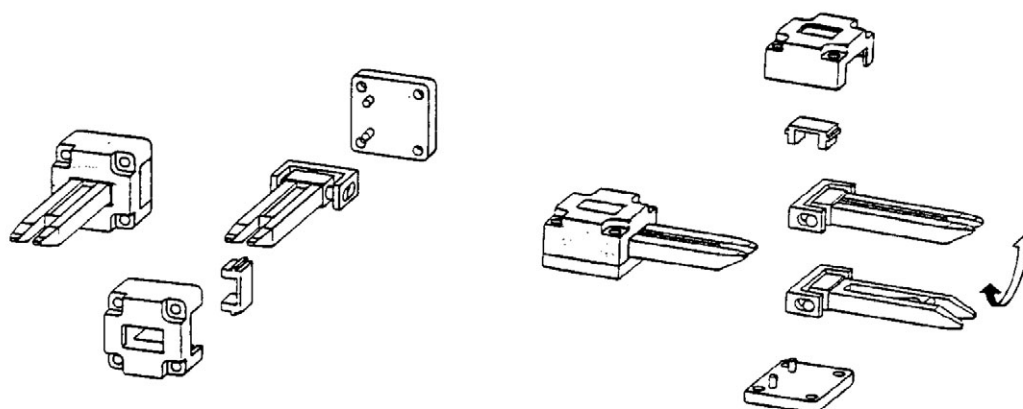
Setting the switching direction



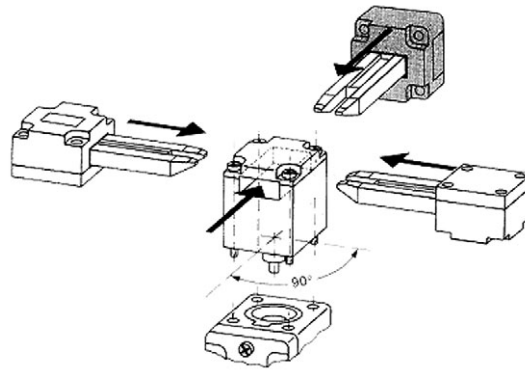
11447E00

*) Do not dismantle the plunger

Mounting the position switch with separate actuators (8070/1.-ZB)



11448E00

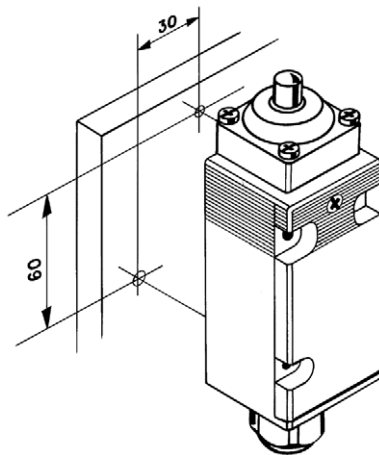


11449E00



The switching element should not be removed from its enclosure for connection. If the switching element is removed, use for example a screwdriver to press down the metal plunger while reinserting it.

**Mounting the position switch using two screws, min. M 5 x 40;
tightening torque = 1.2 Nm**



11443E00



When explosion-protected electrical equipment is exposed to the weather, it is advisable to provide a protective cover or wall.

8 Transport and Storage

Transport and storage are only permitted in the original packing.

9 Installation

Mains Connection

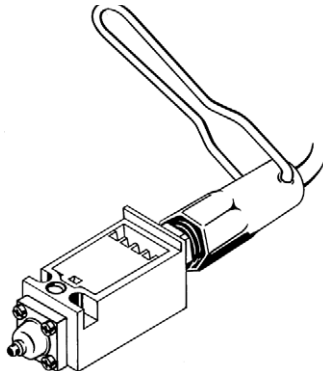
- ▶ The conductors must be carefully connected.
- ▶ The conductor insulation must reach to the terminal. The conductor itself must not be damaged (nicked) when removing the insulation.
- ▶ Ensure that the maximum permissible conductor temperatures are not exceeded by suitable selection of cables and means of running them.
- ▶ Please also refer to the terminal details in the technical data.

Back-Up Fuses

For short-circuit protection, a back-up fuse rated at max. 10 A with tripping characteristic gL/gG according to IEC 60269-1 may be used.

Instructions regarding cable connections and contact replacement

- ▶ Dismantle 50 mm of the wire and strip 6 mm of the conductor insulation.
- ▶ Open cover.
- ▶ Insert the wire into the cable entry and connect it to the contact.
- ▶ Close cover.
- ▶ Tighten the cable glands (tightening torque see "Technical Data").



11450E00

10 Commissioning

Before commissioning the device, ensure that:

- ▶ the device has been installed according to the directions
- ▶ the device is not damaged
- ▶ connections have been made correctly
- ▶ all screws and nuts are fully tightened
- ▶ the terminal compartment is clean
- ▶ there are no foreign bodies inside the device
- ▶ the cables and wires have been inserted correctly
- ▶ the cable glands and stopping plugs are securely tightened
- ▶ no part of the flameproof enclosure is damaged



	Do not use the switch as a mechanical stop. Secure the limit switch against position change by means of a locking device.
---	---

11 Maintenance and Servicing

Repairs and maintenance work on the devices may only be carried out by appropriately authorised and trained personnel.

Before work commences the devices must be disconnected from the mains.

WARNING
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Observe the relevant national regulations in the country of use!
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The following points must be checked during maintenance:

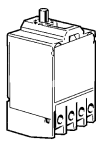
- ▶ clamping screws holding the cables are securely seated
- ▶ service temperature (according to IEC/EN 61241-0)
- ▶ cracks in plastic enclosures
- ▶ Damage to the seals

12 Accessories and Spare Parts

⚠ WARNING

Use only original spare parts as well as original accessories made by R. STAHL Schaltgeräte GmbH.

Designation	Illustration		Order number	Weight kg	
Actuator	 05652E00	Extended plunger	8070/1-0-S	131805	0.044
	 05653E00	Roller plunger	8070/1-0-RS	131809	0.042
	 05653E00	Roller lever, form E (can be modified into an angled roller lever)	8070/1-0-AR	131812	0.046
	 05655E00	Swivelling roller lever, form A	8070/1-0-HR311	131815	0.099
		Swivelling roller lever, form A (swivelling lever of stainless steel)	8070/1-0-HR311NR	131841	
	 05656E00	Adjustable roller lever	8070/1-0-HV	131818	0.148
	 05657E00	Actuating rod	8070/1-0-HH-K	131821	0.162
	 05658E00	Spring-rod actuator Only for use with snap- action contact!	8070/1-0-F2	131824	0.059
		Safety switch with separate actuator (safety operating head)	8070/1-0-ZB	131832	0.071
Safety switch with separate actuator (actuating element)		8070/1-0-ZB	131835	0.039	
Cable gland	 05864E00	8161/5-M 20-13	1 piece	138518	0.012
		8161/5-M 25-17	1 piece	138520	0.016

Designation	Illustration				Order number	Weight kg
Contact		1 NC + 1 NO	Slow-action contact	8080/1-1	132529	0.025
		2 NC	Slow-action contact	8080/1-3	132532	0.025
		2 NO	Slow-action contact	8080/1-4	132533	0.025
		1 NC + 1 NO	Slow-action contact, make before break	8080/1-5	132534	0.025
		1 NC + 1 NO	Snap-action contact, with spring	8080/1-2	132530	0.025

13 Disposal

Observe the national standard for refuse disposal.

	We are pleased to answer any special questions you may have. Please contact your nearest R. STAHL representative.
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14 EC Type Examination Certificate (Page 1)

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin



(1) **EC-TYPE-EXAMINATION CERTIFICATE**
(Translation)

- (2) Equipment and Protective Systems Intended for Use in
Potentially Explosive Atmospheres - **Directive 94/9/EC**
- (3) EC-type-examination Certificate Number:



PTB 01 ATEX 1053

- (4) Equipment: Position switch, type 8070/1-.....
- (5) Manufacturer: R. STAHL Schaltgeräte GmbH
- (6) Address: Am Bahnhof 30, D-74638 Waldenburg (Württ.), Germany
- (7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.
- (8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
- The examination and test results are recorded in the confidential report PTB Ex 01-11057.
- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 50014:1997 +A1 +A2 EN 50018:1994 EN 50019:2000
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.
- (12) The marking of the equipment shall include the following:



II 2 G EEx ed IIC T6

Zertifizierungsstelle Explosionschutz
By order

Dr.-Ing. U. Klausmeyer
Regierungsdirektor



Braunschweig, August 09, 2001

sheet 1/3

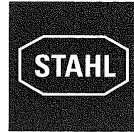
EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig



15 EC Declaration of Conformity

EG-Konformitätserklärung EC-Declaration of Conformity CE-Déclaration de Conformité



Wir (we; nous)

R. STAHL Schaltgeräte GmbH, Am Bahnhof 30, 74638 Waldenburg, Germany

8070/1-.-...

erklären in alleiniger Verantwortung, dass das Produkt
hereby declare in our sole responsibility, that the product
déclarons de notre seule responsabilité, que le produit

Positionsschalter
Position switch
Contacts fin de course

mit der EG-Baumusterprüfbescheinigung:
(under; EC-Type Examination Certificate;
avec) Attestation d'examen CE de type:

PTB 01 ATEX 1053

auf das sich diese Erklärung bezieht, mit den folgenden Normen oder normativen Dokumenten übereinstimmt

which is the subject of this declaration, is in conformity with the following standards or normative documents

auquel cette déclaration se rapporte, est conforme aux normes ou aux documents normatifs suivants

Bestimmungen der Richtlinie
terms of the directive
prescription de la directive

Nummer sowie Ausgabedatum der Norm
Number and date of issue of the standard
Numéro ainsi que date d'émission des normes

94/9/EG: ATEX-Richtlinie
94/9/EC: ATEX Directive
94/9/CE: Directive ATEX

EN 50014: 1997 + A1 + A2
EN 50018: 2000
EN 50019: 1994
EN 60079-0: 2004
EN 60079-1: 2004
EN 60079-7: 2003
prEN 61241-0: 200x (IEC 61241-0: 2004)
EN 61241-1: 2004

2004/108/EG: EMV-Richtlinie
2004/108/EC: EMC Directive
2004/108/CE: Directive CEM

EN 60529: 2000
EN 60947-5-1: 1997

Qualitätssicherung Produktion:
Production Quality Assessment:
Assurance Qualité Production:

PTB 96 ATEX Q006-4

Kenn-Nr. der benannten Stelle / Notified Body number / N° de l'organisme de certification: 0102

Waldenburg, 05. Nov. 2007

i.V.

i.V.

Ort und Datum
Place and date
lieu et date

B. Limbacher
Leiter Entwicklung
Head of Development
Directeur Développement

Dr. S. Jung
Leiter Qualitätsmanagement
Director Quality Management Dept.
Directeur Dept. Assurance de Qualité

TXV 03/99 Papier chlorfrei



